



US 20190294214A1

(19) **United States**(12) **Patent Application Publication**
Mathew et al.(10) **Pub. No.: US 2019/0294214 A1**(43) **Pub. Date: Sep. 26, 2019**(54) **PORTABLE COMPUTER DISPLAY
STRUCTURES****Publication Classification**(71) Applicant: **Apple Inc.**, Cupertino, CA (US)(72) Inventors: **Dinesh C. Mathew**, San Francisco, CA (US); **Thomas W. Wilson, JR.**, Saratoga, CA (US); **Victor H. Yin**, Cupertino, CA (US); **Bryan W. Posner**, San Francisco, CA (US); **Chris Ligtenberg**, San Carlos, CA (US); **Brett W. Degner**, Menlo Park, CA (US); **Peteris K. Augenbergs**, Woodside, CA (US)(51) **Int. Cl.****G06F 1/16**

(2006.01)

H05K 5/00

(2006.01)

(52) **U.S. Cl.**CPC **G06F 1/1637** (2013.01); **G06F 1/1658** (2013.01); **G02F 1/133308** (2013.01); **H05K 5/0017** (2013.01); **G06F 1/1601** (2013.01)

(57)

ABSTRACT(21) Appl. No.: **16/437,830**(22) Filed: **Jun. 11, 2019****Related U.S. Application Data**

(63) Continuation of application No. 15/782,458, filed on Oct. 12, 2017, now Pat. No. 10,353,432, which is a continuation of application No. 14/520,079, filed on Oct. 21, 2014, now abandoned, which is a continuation of application No. 13/786,344, filed on Mar. 5, 2013, now Pat. No. 8,866,989, which is a continuation of application No. 13/249,174, filed on Sep. 29, 2011, now Pat. No. 8,395,722, which is a continuation of application No. 12/483,206, filed on Jun. 11, 2009, now Pat. No. 8,456,586.

An electronic device housing may have upper and lower portions that are attached with a hinge. At least one portion of the housing may have a rear planar surface and peripheral sidewalls having edges. A display module may be mounted in the housing. The display module may have glass layers such as a color filter glass layer and a thin-film transistor substrate. The color filter glass layer may serve as the outermost glass layer in the display module. The edges of the display module may be aligned with the edges of the peripheral housing sidewalls to create the appearance of a borderless display for the electronic device. The display module may be provided with an opening that allows a camera or other electronic components to receive light. Traces may be provided on the underside of the thin-film transistor substrate to serve as signal paths for the electrical components.

